

## Case Study

### Durethan® DP 2802/30 for washing machines

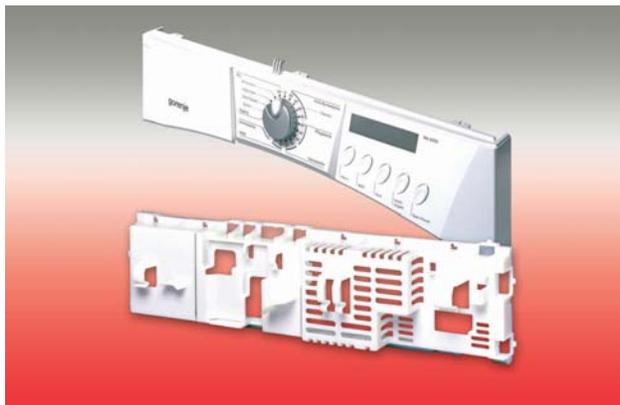


Figure 1 Electronic housings for washing machine front panels made from Durethan DP 2802/30

Plastics used for live components in domestic appliances that are left unattended, such as refrigerators, washing machines and dishwashers, must satisfy the IEC 60335-1 standard for domestic appliances, which has recently been made more stringent. As soon as the current exceeds 0.2 amps, the glow wire test requirements specify a GWFI (glow wire flammability index) value of 850 °C and a GWIT (glow wire ignition temperature) value of 775 °C for all insulating materials. This is a huge obstacle for most polyamide grades. LANXESS has now developed a range of Durethan® grades that meet the domestic appliance standard. Durethan® DP 2802/30 and Durethan® DP 2801 have been used to develop two PA 66 grades that not only meet the standard but are also halogen-free in line with the present trend for using halogen-free plastics in electrical and electronic equipment.

**Material:** Durethan® DP 2802/30

**OEM:** Gorenje d.d., Slovenia.

**Industry:** Appliance

The two materials are already used in various electronic housings for washing machine panels produced by Gorenje d.d., a leading European manufacturer of domestic appliances headquartered in Velenje, Slovenia. These applications meet the aforementioned IEC 60335-1 standard for domestic appliances.

Durethan® DP 2802/30 contains 30 % glass fibers, while Durethan® DP 2801 is not reinforced. Both materials reach a GWIT of 775 °C for a specimen thickness of just 0.75 millimeters. The glow wire test to ascertain the GWFI (glow wire flammability index) is passed at the maximum temperature of 960 °C. The flame-retardant package of both materials is halogen- and phosphorus-free. Both materials have an excellent tracking resistance of 600 Volts (CTI A). The risk of equipment faults and short-circuiting



caused by leakage currents is consequently extremely small.

LANXESS also supplies corresponding PA 6 grades. Durethan® DP 1852/30 contains 30 % glass fibers and has achieved V-0 classification. The GWIT value of 775 °C is reached at 0.75 millimeters, and a GWIT value of 800 °C is attained with thicker walls. The flame retardant package of DP 1852/30 con-

tains halogen. Durethan® DP 1803/10 is a halogen-free V-2 grade with a mineral-based flame retardant which achieves a GWIT of 775 °C in all typical wall thicknesses. This product also has a tracking resistance of 600 Volts, an HWI of 2 and an HAI of 0. Durethan® DP 1803/10 can therefore be used in insulating materials in accordance with the UL 508.

---

Durethan® and Pocan® are registered trademarks of LANXESS Deutschland GmbH

The manner in which you use and the purpose to which you put and utilize our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations, are beyond our control. Therefore, it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether they are suitable for your intended uses and applications. This application-specific analysis must at least include testing to determine suitability from a technical as well as health, safety and environmental standpoint. Such testing has not necessarily been done by us. Unless we otherwise agree in writing, all products are sold strictly pursuant to the terms of our standard conditions of sale. All information and technical assistance is given without warranty or guarantee, and is subject to change without notice. It is expressly understood and agreed that you assume and hereby expressly release us from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance and information. Any statement or recommendation not contained herein is unauthorized and shall not bind us. Nothing herein shall be construed as a recommendation to use any product in conflict with patents covering any material or its use. No license is implied or in fact granted under the claims of any patent.

#### Developmental Product

Any product designated as a developmental product is not considered part of the LANXESS Corporation line of standard commercial products. Complete commercialization and continued supply are not assured. The purchaser/user agrees that LANXESS Corporation reserves the right to discontinue this product without prior notice.

#### Typical Properties

Property data is provided as general information only. Property values are approximate and are not part of the product specifications.

#### Flammability

Flammability results are based on small-scale laboratory tests for purposes of relative comparison and are not intended to reflect the hazards presented by this or any other material under actual fire conditions.

#### Health and Safety

Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling LANXESS products mentioned in this publication. Before working with these products, you must read and become familiar with the available information on their hazards, proper use, and handling. This cannot be overemphasized. Information is available in several forms, e.g., material safety data sheets (MSDS) and product labels. Consult your LANXESS Corporation representative or contact the Product Safety and Regulatory Affairs Department at LANXESS. For materials that are not LANXESS products, appropriate industrial hygiene and other safety precautions recommended by their manufacturer(s) must be followed.

#### Regulatory Compliance

Some of the end uses of the products described in this brochure must comply with applicable regulations, such as the FDA, NSF, USDA and CPSC. If you have any questions on the regulatory status of any LANXESS engineering thermoplastic, consult your LANXESS Corporation representative or contact the LANXESS Regulatory Affairs Manager.

#### Regrind

Where end-use requirements permit, regrind may be used with virgin material in quantities specified in individual product information bulletins, provided that the material is kept free of contamination and is properly dried (see maximum permissible quantities and drying conditions in product information bulletins). Any regrind used must be generated from properly molded/extruded parts, sprues, runners, trimmings and/or film. All regrind used must be clean, uncontaminated, and thoroughly blended with virgin resin prior to drying and processing. Under no circumstances should degraded, discolored, or contaminated material be used for regrind. Materials of this type should be discarded. Improperly mixed and/or dried regrind may diminish the desired properties of a particular LANXESS product. It is critical that you test finished parts produced with any amount of regrind to ensure that your end-use performance requirements are fully met. Regulatory or testing organizations (e.g., UL) may have specific requirements limiting the allowable amount of regrind. Because third party regrind generally does not have a traceable heat history or offer any assurance that proper temperatures, conditions, and/or materials were used in processing, extreme caution must be exercised in buying and using regrind from third parties. The use of regrind material should be avoided entirely in those applications where resin properties equivalent to virgin material are required, including but not limited to color quality, impact strength, resin purity, and/or load-bearing performance.

#### Color and visual effects

Type and quantity of pigments or additives used to obtain certain colors and special visual effects can affect mechanical properties.

#### Note:

The information contained in this publication is current as of August, 2008. Please contact LANXESS Corporation to determine if this publication has been revised.

© = LANXESS Corporation 2008 | Pittsburgh, PA 15275 | SCP Business Unit | all rights reserved

<http://us.durethan.com>

Page 2 of 2 - this document contains important information and must be read in its entirety | Edition 28.08.2008 | TI 2006-005 US

